

WHAT IS CLAIMED IS:

1. A digital audio amplifier comprising:
 - a power PMOS transistor which has a source to which a first power supply voltage is applied and a drain connected to a common node;
 - 5 a power NMOS transistor which has a drain connected to the common node and a source to which a second power supply voltage is applied;
 - an output node filter which is connected to the common node;
 - 10 a phase lead-lag compensator which lead-lag compensates for the phase of an output signal of the output node filter;
 - an error amplifier which compares an output signal of the phase lead-lag compensator with an input audio signal and amplifies an error between the output signal and the input audio signal;
 - 15 a comparator which converts an error amplified by the error amplifier into a pulse signal; and
 - 20 a gate driver which controls a gate of the power PMOS transistor and a gate of the power NMOS transistor in response to the pulse signal, wherein the phase lead-lag compensator increases self-oscillation frequency by lead-lag-compensating for the phase of the output signal of the output node filter.
2. The digital audio amplifier of claim 1 further comprising a bandwidth control means which adjusts the bandwidth of the error amplifier.
- 25 3. The digital audio amplifier of claim 1, wherein the phase lead-lag compensator comprises:
 - a first resistor which is provided between an output node of the output node filter and an output node of the phase lead-lag compensator;
 - 30 a capacitor which is connected to the first resistor in parallel between the output node of the output node filter and the output node of the phase lead-lag compensator; and
 - 35 a second resistor which is provided between the output node of the phase lead-lag compensator and ground voltage.

4. The digital audio amplifier of claim 1, wherein the phase lead-lag compensator comprises:
 - a first resistor which is provided between an output node of the output node filter and an inner node;
 - 5 a capacitor which is connected to the first resistor in parallel between the output node of the output node filter and the inner node;
 - a second resistor which is provided between the inner node and an output node of the phase lead-lag compensator; and
 - 10 a third resistor which is provided between the output node of the phase lead-lag compensator and ground voltage.
5. The digital audio amplifier of claim 1, wherein the phase lead-lag compensator comprises:
 - a first resistor which is provided between an output node of the output node filter and an output node of the phase lead-lag compensator;
 - 15 a second resistor which is provided between the output node of the phase lead-lag compensator and an inner node;
 - a third resistor which is provided between the inner node and ground voltage; and
 - 20 a capacitor which is provided between the output node of the output node filter and the inner node.
6. The digital audio amplifier of claim 2, wherein the error amplifier comprises:
 - 25 an operational amplifier which has an output node connected to an input node of the comparator and a first input node connected to the input audio signal;
 - a first resistor which is provided between an output node of the phase lead-lag compensator and a second input node of the operational amplifier;
 - 30 a second resistor which is provided between the second input node of the operational amplifier and the output node of the operational amplifier; and
 - a capacitor which is connected to the second resistor in parallel between the second input node and output node of the operational amplifier.

7. The digital audio amplifier of claim 1, wherein the output node filter comprises:

an inductor which is provided between the common node and an output node of the output node filter;

5 a first capacitor one end of which is connected to the output node of the output node filter; and

a first resistor which is provided between the other end of the first capacitor and ground voltage.

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8. The digital audio amplifier of claim 7, wherein the phase lead-lag compensator comprises:

a second resistor which is provided between the output node of the output node filter and the output node of the phase lead-lag compensator;

15 a second capacitor which is connected to the second resistor in parallel between the output node of the output node filter and the output node of the phase lead-lag compensator;

a third resistor which is provided between the output node of the phase lead-lag compensator and the ground voltage; and

20 a third capacitor which is provided between the output node of the phase lead-lag compensator and the other end of the first capacitor.